Morphological Variation of Sickle Alfalfa (*Medicago falcata* L.) in China

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Introduction Sickle alfalfa (*Medicago falcata* L .) is a winter-hardy , drought-resistant , salt-tolerant and long-lived excellent perennial leguminous forage in cold grasslands of China , which specially plays an important role in grasslands of Xinjiang and Inner Mongolia . Collections of *Medicago falcata* from different areas of Xinjiang and Inner Mongolia are valuable and rare sources of genes for alfalfa breeding . The morphological variations of 30 accessions of *Medicago falcata* were examined in this study . The analysis of morphological characters among 30 native populations is important to select suitable germplasm and it is useful for breeding programs of alfalfa in arid , semi-arid and cold region in China .

Materials and methods A total of 30 native accessions of *Medicago falcata* were collected from 10 areas of Xinjiang . Node , inflorescence , second branches per stem , internode and first internode length , stem diameter , leaf size , inflorescence , rhachis , flower , flower stalk and calyx length , number of flower per inflorescence , taproot diameter , root crown height , length , width and position and 100 seeds weight were examined respectively on flowering and seeding stage . These data were analysed by SAS 8 .2 .

Results The coefficients variation (CV) ranged from 21 .08% (Inner Mongolia) to 34 .84% (Xinjiang) , but the average of 10 populations in Xinjiang (24 .23%-34 .81%) indicated higher variations than 8 populations of Inner Mongolia (21 .08%-33. 51%) , with average of 18 .26% (Xinjiang) ,18 .92 (Inner Mongolia) and 19 .13% (China) among populations showed lower variations than that in populations (Table1) . The basis analysis showed that first and second factor cumulative offer up to 97. 03% in Xinjiang accessions . The eigenvectors of number of node , second branches and inflorescence per stem , root crown length and width were bigger than others . Inner Mongolia , first factor cumulative offer up to 91 .21% , and the eigenvectors of number of second branches and inflorescence per stem were bigger than others . The morphological variations of Xinjiang native accessions of *Medicago falcata* were different from Inner Mongolia .

Table 1 *Morphological variation of Sickle alfalfa (*Medicago falcata *L .) in China .*

Site	Xinjiang of China	Inner Mongolia of China	China
Average CV within populations (%)	24 .23-34 .81	21 .08-33 .51	21 .08-34 .81
Average CV among populations (%)	18 .26	18 .92	19 .13

Conclusions The average coefficients variation in every site indicated considerable morphological variations within populations were more than that among populations of *M . falcata* , and the morphological variations consist in every index which was examined . The open pollination , out-cross system , habitat and geographic distribution , as well as the strong gene flow and the environments resulted in a great amount of morphological variations of *M . falcata* . The morphological variations of *M . falcata* in Xinjiang were more than that in Inner Mongolia , and the principal source of the variations were different between Xinjiang and Inner Mongolia .

Reference

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